



Faculty of Computer Science and Information Technology

## **Veterinary Clinic Management System**

**Ainin Sofea Binti Azhari**  
**58419**

Bachelor of Computer Science with Honors  
(Multimedia Computing)  
2020

# **Veterinary Clinic Management System**

AININ SOFEA BINTI AZHARI

This project is submitted in partial fulfillment of the  
requirements for the degree of  
Bachelor of Computer Science with Honors  
(Multimedia Computing)

Faculty of Computer Science and information Technology  
UNIVERSITI MALAYSIA SARAWAK  
2020

# **Veterinary Clinic Management System**

AININ SOFEA BINTI AZHARI

Projek ini merupakan salah satu keperluan untuk  
Ijazah Sarjana Muda  
Sains Komputer dengan Kepujian  
(Pengkomputeran Multimedia)

Fakulti Sains Komputer dan Teknologi Maklumat  
UNIVERSITI MALAYSIA SARAWAK  
2020

UNIVERSITI MALAYSIA SARAWAK

THESIS STATUS ENDORSEMENT FORM

TITLE VETERINARY CLINIC MANAGEMENT SYSTEM

ACADEMIC SESSION: 2019/2020

(CAPITAL LETTERS)

hereby agree that this Thesis\* shall be kept at the Centre for Academic Information Services, Universiti Malaysia Sarawak, subject to the following terms and conditions:

1. The Thesis is solely owned by Universiti Malaysia Sarawak
2. The Centre for Academic Information Services is given full rights to produce copies for educational purposes only
3. The Centre for Academic Information Services is given full rights to do digitization in order to develop local content database
4. The Centre for Academic Information Services is given full rights to produce copies of this Thesis as part of its exchange item program between Higher Learning Institutions [ or for the purpose of interlibrary loan between HLI ]
5. \*\* Please tick ( ✓ )

☐

CONFIDENTIAL

(Contains classified information bounded by the OFFICIAL SECRETS ACT 1972)

☐

RESTRICTED

(Contains restricted information as dictated by the body or organization where the research was conducted)

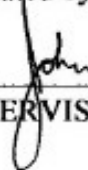
☒

UNRESTRICTED



(AUTHOR'S SIGNATURE)

Validated by



(SUPERVISOR'S SIGNATURE)

Permanent Address

NO. 54, JALAN MEKAR 2,  
TAMAN DESA MEKAR 1  
34200 PAPET BUNTAK, PERAK

Date: 4/8/2020

Date: 4/8/2020

Note \* Thesis refers to PhD, Master, and Bachelor Degree

\*\* For Confidential or Restricted materials, please attach relevant documents from relevant organizations / authorities

## DECLARATION

I hereby declare that this project is my original work. I have not copied from any other student's work or from any other sources except where due reference or acknowledgement is not made explicitly in the text, nor has any part had been written for me by another person.



.....  
(AININ SOFEA BINTI AZHARI)

DATE : 05 AUGUST 2020

## **ACKNOWLEDGEMENT**

Praise and thanks to Allah, the project is completed successfully within the given duration of time. I would like to thank all those who have given me the possibility to complete this report. First and foremost, I am heartily thankful to my Final Year Project supervisor, Encik Mohamad Johan bin Ahmad Khiri for his guidance and advice, encouragement and support throughout my Final Year Project development from the beginning to the end of the project. I would also like to acknowledge with much appreciation to my Final Year Project 1 examiner, Madam Seleviawati Binti Tarmizi for willing to examine and give comments on my project. Besides, special thank you to Dr Wang Yin Chai, the coordinator for Final Year Project, for all the talks and briefing regarding the course. Also, a special thanks to my friends who willing to spend their times with me to improve my project, as well as helping me to develop my ideas by reading and commenting my report. Last but not least, a special thanks also goes to my family especially my parents, Encik Azhari bin Mustaffa and Puan Junaidah bin Mat Judin who always support and encourage me throughout my final year project journey.

## **ABSTRACT**

This is a Veterinary Clinic Management System that being proposed for this project. The proposed system is being developed to solve the problems that facing by the most of veterinary clinics which are currently using traditional method in operating their organisations in manually or physical filling especially on their pets' vaccination cards. This is because the method has some drawbacks such as the for pet vaccination card can be easily misplaced, missing or the pet owner would forget to bring them before going to veterinary clinics in order to get a vaccination and deworming services for their pets. Besides, the difficulty of the pet owner to make any appointment services for their pets by making a phone call or visit at the clinic is inconvenient for them. In addition, staff and veterinarian are unable to access the records of the patients(pet owner and pet) visiting the clinic. Thus, a web-based system and mobile application for pets' vaccination card is being proposed to overcome the mentioned downsides. Veterinary Clinic Management System is a system that allows that pet owner to access their pets' medical record, to request an online appointment and to receive a notification of the appointment. Not only it would be beneficial to the pet owners, it will also reduce the workload of veterinary clinic staff; especially in the management of files containing the pet owner and pets' information as well as they able to generate daily, weekly or monthly clinic report for the patients(pet owner and pets) who comes to the clinics for the clinic references. For pet vaccination E-card mobile application, this apps is for pet owner to view the details of their pets' vaccination appointment details such as the type of the vaccination and the next date for the vaccination and deworming services. The method used in the proposed system is the System Development Life Cycle (SDLC) model which consists of seven phases where each of the phase will be describes in the chapter of the reports.

## **ABSTRAK**

Ini adalah Sistem Pengurusan Klinik Veterinar yang dicadangkan untuk projek ini. Sistem yang dicadangkan ini dibangunkan untuk menyelesaikan masalah yang dihadapi oleh kebanyakan klinik veterinar kini menggunakan kaedah tradisional dalam mengendalikan organisasi mereka secara manual atau pemfailan fizikal terutamanya pada penggunaan kad vaksin klinik oleh haiwan peliharaan mereka. Ini kerana kaedah ini mempunyai beberapa kelemahan seperti kad vaksin tersebut mudah disalahletak, hilang atau pemilik haiwan peliharaan lupa untuk membawa kad tersebut sebelum ke klinik untuk mendapatkan perkhidmatan vaksin dan “deworming” untuk haiwan peliharaan mereka. Kesukaran pemilik haiwan peliharaan untuk membuat sebarang perkhidmatan temu janji untuk haiwan peliharaan mereka melalui panggilan telefon atau melawat di klinik adalah menyusahkan bagi mereka. Di samping itu, kakitangan dan doktor haiwan tidak dapat melihat rekod pesakit(pemilik haiwan peliharaan dan haiwan peliharaan) yang datang ke klinik. Oleh itu, sistem berasaskan web dan aplikasi mudah alih untuk kad vaksin haiwan dicadangkan untuk mengatasi kelemahan tersebut. Sistem Pengurusan Klinik Veterinar adalah sistem yang membenarkan pemilik haiwan peliharaan untuk mengakses rekod perubatan haiwan mereka, membuat temu janji dan menerima pemberitahuan temu janji. Bukan sahaja ia memberi manfaat kepada pemilik haiwan peliharaan, ia juga akan mengurangkan beban kerja kakitangan klinik; terutamanya dalam menguruskan fail-fail yang mengandungi maklumat pemilik haiwan peliharaan dan haiwan peliharaan serta mereka dapat menghasilkan laporan klinik harian, mingguan atau bulanan untuk pesakit(pemilik haiwan peliharaan dan haiwan peliharaan) yang datang ke klinik untuk rujukan klinik. Untuk aplikasi mudah alih E-kad vaksin haiwan peliharaan, aplikasi ini adalah untuk pemilik haiwan peliharaan untuk melihat butiran vaksin temu janji mereka seperti jenis vaksinasi dan tarikh seterusnya untuk perkhidmatan vaksin dan “deworming”.



## Table of Contents

<b>ABSTRACT.....</b>	<b><i>ii</i></b>
<b>ABSTRAK.....</b>	<b><i>iii</i></b>
<b>CHAPTER 1 : INTRODUCTION.....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 Problem Statement.....	2
1.3 Aim and Project Objectives .....	3
1.4 Brief Methodology .....	4
1.5 Scope of Project .....	6
1.6 Significance of Project .....	7
1.7 Project Schedule .....	7
1.8 Expected Outcome .....	8
1.9 Project Outline.....	9
<b>CHAPTER 2 : LITERATURE REVIEW.....</b>	<b>11</b>
2.1 Introduction .....	11
2.2 Reviews on Similar Existing Systems.....	13
2.2.1 Animal Medical Centre.....	13
2.2.2 Kinabalu Animal Clinic .....	16
2.2.3 Animal Hospital Management System (AHMS) .....	19
2.2.4 VetGeo : (free cloud based veterinary management solution).....	21
2.3 Research Paper Review.....	23
2.3.1 Animal Health System : Pet Health Clinic .....	23
2.3.2 Veterinary Work Management Application – MatVet .....	26
2.4 Comparison on Existing System .....	28
2.5 Reviews of Tools and Technology .....	30
2.5.1 HyperText Markup Language (HTML), Cascading Style Sheet (CSS), PHP.....	30
2.5.2 Bootstrap .....	30
2.5.3 Android Studio .....	31
2.5.4 MySQL .....	31
2.6 Summary.....	32
<b>CHAPTER 3 : REQUIREMENTS ANALYSIS AND DESIGN.....</b>	<b>33</b>
3.1 Introduction .....	33
3.2 Systems Development Life Cycle (SDLC).....	33
3.2.1 System Planning .....	35
3.2.2 System Analysis and Requirement.....	36
3.3 System Design .....	46
3.3.1 Use Case Diagram .....	46
3.3.2 Activity Diagram .....	59
3.3.3 Sequence Diagrams .....	60

3.3.4 Class Diagram.....	68
3.3.5 Interface Design.....	69
3.4 Summary.....	93
<b>CHAPTER 4 : IMPLEMENTATION.....</b>	<b>94</b>
4.1 Introduction .....	94
4.2 Required Components .....	94
4.2.1 Sublime Text .....	95
4.2.2 Android Studio .....	96
4.2.3 XAMPP .....	97
4.2.4 Firebase Console.....	97
4.3 Introduction to User's Roles .....	98
4.4 Veterinary Clinic Management System Interfaces .....	100
4.4.1 Website Main Page.....	100
4.4.2 Login Home Page.....	104
4.4.3 Login Page.....	104
4.4.4 Sign Up Page for User .....	106
4.4.5 Forgot Password Page for User .....	106
4.4.6 Dashboard and Clinic Reporting .....	107
4.4.7 Manage All Pet Owner Registration .....	109
4.4.8 List of Pet Owner's pet.....	110
4.4.9 Pet's Medical History Records .....	111
4.4.10 Pet Vaccination and Deworming Records .....	112
4.4.11 Pet Registration .....	114
4.4.12 Manage All Pet Registration.....	115
4.4.13 Add Patient Waiting List .....	115
4.4.14 Manage All Patient Waiting List.....	116
4.4.15 Details of Medication Prescription.....	117
4.4.16 Selecting Appointment's Type.....	117
4.4.17 Calendar Appointment .....	118
4.4.18 Manage Appointment Request .....	120
4.4.19 Assign Follow Up for Vaccination and Deworming.....	123
4.4.20 Manage all staff veterinarian.....	124
4.4.21 Manage Clinic Information .....	125
4.4.22 Manage Pet Services.....	126
4.4.23 Veterinarian Home Page.....	126
4.4.24 Veterinarian Calendar Page.....	127
4.4.25 All Veterinarian Appointment Details Page.....	128
4.4.26 Add Medication Prescription .....	129
4.4.27 Manage Ask Vet page.....	130
4.4.28 User Homepage.....	131
4.4.29 User Profile .....	131
4.4.30 Medical Records of All Pet Owner's Pet .....	132
4.4.31 Pet Details.....	133
4.4.32 Pet Vaccination and Deworming Records History .....	134
4.4.33 Booking Home Page .....	135
4.4.34 Request an Appointment .....	135
4.4.35 Manage Appointment.....	137
4.5 Pet Vaccination E-card Mobile Application Interfaces .....	138
4.5.1 User Login Page.....	138
4.5.2 Home Page .....	138

4.5.3 Notification Message Received in Background App.....	139
4.5.4 My Profile.....	140
4.5.5 My Pet .....	141
4.5.6 Pet Details.....	141
4.5.7 List View of Vaccination and Deworming Records.....	142
4.5.8 Details of Vaccination and Deworming Records .....	143
4.5.9 Create PDF for Vaccination and Deworming Records .....	144
4.5.10 Save PDF .....	145
4.5.11 Select Printer.....	146
4.6 Summary.....	146
<b>CHAPTER 5 : TESTING .....</b>	<b>147</b>
5.1 Introduction .....	147
5.2 Functional Testing .....	147
5.2.1 Test Cases.....	147
5.3 Non-functional Testing .....	170
5.3.1 Usability Testing.....	170
5.3.2 Compatibility Testing.....	170
5.4 Summary.....	171
<b>CHAPTER 6 : FUTURE WORKS.....</b>	<b>172</b>
6.1 Introduction .....	172
6.2 Objectives Achievement.....	172
6.3 Project Limitations .....	173
6.4 Future Works.....	173
6.5 Conclusions .....	174

## List of Figures

Figure 1. 1 SDLC phases (Kendall & Kendall, 2005) .....	4
Figure 1. 2 Project Schedule for FYP 1 .....	8
Figure 1. 3 Project Schedule for FYP 2 .....	8
Figure 2. 1 Animal Medical Centre Website (Animal Medical Centre, n.d.) .....	13
Figure 2. 2 Online appointment for Veterinary Appointment page (Animal Medical Centre, n.d.) .....	14
Figure 2. 3 Online appointment for Boarding Reservation page (Animal Medical Centre, n.d.) .....	15
Figure 2. 4 Online appointment for Grooming Appointment page (Animal Medical Centre, n.d.) .....	15
Figure 2. 5 Choose Type of Appointment Services (Kinabalu Animal Clinic, n.d.) .....	17
Figure 2. 6 Selecting Date and Time for Online Appointment (Kinabalu Animal Clinic, n.d.) .....	17
Figure 2. 7 Online Appointment Form for Vaccination (Kinabalu Animal Clinic, n.d.) .....	18
Figure 2. 8 Kinabalu Animal Clinic Mobile Application (Kinabalu Animal Clinic, n.d.) .....	19
Figure 2. 9 Vaccination records (Animal Hospital Management System (AHMS), n.d.) .....	20
Figure 2. 10 Vet Geo System ( <a href="http://www.vetgeo.com/www.vetgeo.com">http://www.vetgeo.com/www.vetgeo.com</a> VetGeo – Free Veterinary Management Software In The Cloud, n.d.) .....	21
Figure 2. 11 Patient (Pet Owner and Pet) details ( <a href="http://www.vetgeo.com/www.vetgeo.com">http://www.vetgeo.com/www.vetgeo.com</a> VetGeo – Free Veterinary Management Software In The Cloud, n.d.) .....	22
Figure 2. 12 Appointment Scheduling (Amin, Animal Health System : Pet Health Clinic, 2011) .....	24
Figure 2. 13 Grooming Appointment Scheduling (Amin, Animal Health System : Pet Health Clinic, 2011) .....	24
Figure 2. 14 Pet Hostel Appointment Scheduling (Amin, Animal Health System : Pet Health Clinic, 2011) .....	25
Figure 3. 1 Systems Development Life Cycle (SDLC) phases .....	33
Figure 3. 2 Result of questionnaire for respondent's gender .....	38
Figure 3. 3 Result of questionnaire for respondent's age .....	39
Figure 3. 4 Result of questionnaire for people who owned pet .....	39
Figure 3. 5 Result of questionnaire on request an appointment .....	40
Figure 3. 6 Result of questionnaire on how respondents view appointment details of their pet vaccination and deworming. ....	41
Figure 3. 7 Veterinary Clinic Management System Use Case Diagram .....	47
Figure 3. 8 Veterinary Clinic Management System Activity Diagram .....	60
Figure 3. 9 Login sequence diagram for user .....	61
Figure 3. 10 Registration sequence diagram for patients (pet owner and pet) .....	61
Figure 3. 11 Update patient (pet and owner) details sequence diagram .....	62
Figure 3. 12 Book an Appointment sequence diagram .....	63
Figure 3. 13 Change Appointment Details sequence diagram for pet owner .....	64
Figure 3. 14 Change Appointment Details sequence diagram for front-desk staff .....	64
Figure 3. 15 Cancel Appointment by pet owner sequence diagram .....	65
Figure 3. 16 Cancel Appointment by front-desk staff sequence diagram .....	65
Figure 3. 17 View appointment history sequence diagram .....	66
Figure 3. 18 View Patient Record by front-desk staff and veterinarian sequence diagram .....	66
Figure 3. 19 Prescribe medication sequence diagram .....	67
Figure 3. 20 Generate Report sequence diagram .....	67
Figure 3. 21 Veterinary Clinic Management System Class Diagram .....	68
Figure 3. 22 Welcome page sample for user (front-desk staff, veterinarian and pet owner) .....	69
Figure 3. 23 Login page sample for user (front-desk staff, veterinarian and pet owner) .....	70
Figure 3. 24 Front-desk staff Homepage sample .....	70
Figure 3. 25 Pet Owner Homepage sample .....	71
Figure 3. 26 Veterinarian Homepage sample .....	71
Figure 3. 27 Pet Owner Management page sample for staff .....	72
Figure 3. 28 Pet Owner Registration page .....	73
Figure 3. 29 Pet Registration page sample .....	73

Figure 3. 30 Pet management page sample for staff.....	74
Figure 3. 31 Treatment Details for pet .....	75
Figure 3. 32 Medication Prescription Details for pet.....	75
Figure 3. 33 Appointment calendar page sample for staff.....	76
Figure 3. 34 Appointment details of the pet owner and pet .....	76
Figure 3. 35 Appointment Request page sample for staff.....	77
Figure 3. 36 Vaccination page sample for staff.....	77
Figure 3. 37 Add Vaccination Details page sample for staff.....	78
Figure 3. 38 Vaccination Details page sample for staff.....	78
Figure 3. 39 User management page sample for staff.....	79
Figure 3. 40 Veterinary Clinical Reporting page sample for Front-desk staff and veterinarian.....	80
Figure 3. 41 Update News and Events Page for staff.....	80
Figure 3. 42 Clinic Information Page for staff .....	81
Figure 3. 43 Clinic Service Management Page for staff.....	81
Figure 3. 44 Add Clinic Service Page for staff.....	82
Figure 3. 45 Clinic Service Details Management Page for staff .....	83
Figure 3. 46 Pet owner profile for pet owner .....	83
Figure 3. 47 Pet List Medical History for pet owner .....	84
Figure 3. 48 Pet Profile details for pet owner .....	85
Figure 3. 49 Pet's medical records.....	85
Figure 3. 50 Online appointment request page sample for pet owner.....	86
Figure 3. 51 Online appointment details page sample for pet owner.....	87
Figure 3. 52 Prescribe medication page sample for veterinarian .....	87
Figure 3. 53 Login page sample by Pet Owner for Pet Vaccination E-card .....	88
Figure 3. 54 Sign Up page sample by Pet Owner for Pet Vaccination E-card.....	89
Figure 3. 55 Homepage and Sidebar of Pet Vaccination E-card.....	89
Figure 3. 56 Pet Owner profile of Pet Vaccination E-card .....	90
Figure 3. 57 My Pet Page of Pet Vaccination E-card.....	91
Figure 3. 58 Pet Details Page of Pet Vaccination E-card .....	92
Figure 3. 59 Vaccination and Deworming Appointment Details page sample .....	92
Figure 4. 1 Sublime Text Board.....	95
Figure 4. 2 Android Studio Workspace.....	96
Figure 4. 3 XAMPP Starting page .....	97
Figure 4. 4 Firebase Homepage .....	98
Figure 4. 5 Website Main Page for User (pet owner, staff, veterinarian) .....	100
Figure 4. 6 News and Event Page.....	101
Figure 4. 7 News and Event Page for Staff.....	102
Figure 4. 8 Pet Services Page.....	102
Figure 4. 9 Ask Vet Page .....	103
Figure 4. 10 Ask Question's Interface .....	103
Figure 4. 11 Login Homepage for user.....	104
Figure 4. 12 Login Page for Front-desk Staff and Veterinarian.....	105
Figure 4. 13 Login Page for Pet Owner .....	105
Figure 4. 14 Sign Up Page for Pet Owner.....	106
Figure 4. 15 Forgot Password Page for Pet Owner.....	107
Figure 4. 16 Dashboard and Clinic Reporting in Pie Chart.....	108
Figure 4. 17 Dashboard and Clinic Reporting in Graph.....	108
Figure 4. 18 Pet Owner Management Page.....	109
Figure 4. 19 Pet Owner's Registration Form in Bootstrap .....	110
Figure 4. 20 Details of All Pet Owner's Pet .....	110
Figure 4. 21 Details of All Pet Owner's Pet .....	111
Figure 4. 22 Pet's Medical Records History .....	112
Figure 4. 23 Pet Vaccination Records .....	113
Figure 4. 24 Pet Deworming Records .....	113

Figure 4. 25 Pet Vaccination and Deworming Form in Bootstrap .....	114
Figure 4. 26 Pet Registration Form.....	114
Figure 4. 27 Pet Management Page .....	115
Figure 4. 28 Consultation Form in Bootstrap .....	116
Figure 4. 29 Patient Waiting List Management Page.....	116
Figure 4. 30 Details of Medication Prescription in Bootstrap .....	117
Figure 4. 31 Appointment Types Page.....	118
Figure 4. 32 Calendar of Month .....	119
Figure 4. 33 Calendar of Basic Week and Day.....	119
Figure 4. 34 Calendar of Agenda Week and Day .....	119
Figure 4. 35 Appointment Form and Appointment Details in Bootstrap .....	120
Figure 4. 36 Pending Status Page .....	121
Figure 4. 37 Appointment Details in Bootstrap .....	121
Figure 4. 38 Approved Status Page .....	122
Figure 4. 39 Rejected Status Page.....	122
Figure 4. 40 Assign Follow Up for Vaccination .....	123
Figure 4. 41 Assign Follow Up for Deworming.....	123
Figure 4. 42 Send Notification for Vaccination and Deworming .....	124
Figure 4. 43 Staff Veterinarian Management Page .....	124
Figure 4. 44 Details of Veterinary Clinic .....	125
Figure 4. 45 Clinic Photo Management Page .....	125
Figure 4. 46 Pet Service Management Page.....	126
Figure 4. 47 Veterinarian Homepage .....	126
Figure 4. 48 Veterinarian Calendar by Month .....	127
Figure 4. 49 Veterinarian Calendar by Basic Week and Day.....	127
Figure 4. 50 Veterinarian Calendar by Agenda Week and Day .....	128
Figure 4. 51 Veterinarian Appointment Details in Bootstrap.....	128
Figure 4. 52 All Veterinarian Appointment Page .....	129
Figure 4. 53 Add Medication Prescription .....	129
Figure 4. 54 Ask Vet Management Page.....	130
Figure 4. 55 Answer Form for Veterinarian in Bootstrap .....	130
Figure 4. 56 Pet Owner's Homepage .....	131
Figure 4. 57 User Profile.....	131
Figure 4. 58 Change Password Page .....	132
Figure 4. 59 Medical Records History of All Pets of Pet Owner.....	132
Figure 4. 60 Pet's Profile .....	133
Figure 4. 61 Update Pet's Profile.....	133
Figure 4. 62 Pet Vaccination Records History .....	134
Figure 4. 63 Pet Deworming Records History.....	134
Figure 4. 64 Choose Appointment Types .....	135
Figure 4. 65 Request Appointment Page.....	136
Figure 4. 66 View Other Pet Owner's Appointment Details.....	136
Figure 4. 67 Manage Appointment Page .....	137
Figure 4. 68 Notification for Appointment.....	137
Figure 4. 69 User Login for Pet Owner.....	138
Figure 4. 70 Pet Vaccination E-card Homepage.....	139
Figure 4. 71 Notification Message Receive in Background.....	140
Figure 4. 72 Pet Owner's Profile.....	140
Figure 4. 73 List View of All Pet Owner's Pet.....	141
Figure 4. 74 Details of Each Pet.....	142
Figure 4. 75 List View of Vaccination .....	143
Figure 4. 76 List View of Deworming.....	143
Figure 4. 77 Details of Vaccination .....	144
Figure 4. 78 Details of Deworming .....	144
Figure 4. 79 PDF Page of Vaccination Records .....	144
Figure 4. 80 PDF Page of Deworming Records .....	145

Figure 4. 81 Save PDF Option .....	145
Figure 4. 82 Select Printer.....	146

## List of Tables

Table 2. 1 Comparison between the Existing Systems and Proposed System .....	28
Table 3. 1 Technique that have been used in methodology .....	34
Table 3. 2 The software requirements.....	44
Table 3. 3 The hardware requirements.....	46
Table 3. 4 Login Use Case Description .....	48
Table 3. 5 Registration Use Case Description .....	49
Table 3. 6 Choose Type Appointment Use Case Description .....	51
Table 3. 7 Book an Appointment Use Case Description.....	52
Table 3. 8 Cancel Appointment Use Case Description .....	53
Table 3. 9 Change Appointment Use Case Description .....	54
Table 3. 10 View Appointment Details Use Case Description.....	54
Table 3. 11 View Patients' (Pet Owner and Pets) record Use Case Description .....	55
Table 3. 12 Update Patient Details Use Case Description .....	56
Table 3. 13 Assign Schedule Appointment Use Case Description .....	56
Table 3. 14 Prescribe Medication Use Case Description .....	57
Table 3. 15 Generate Report Use Case Description.....	58
Table 5. 1 Login for Veterinary Clinic Management System Test Case.....	148
Table 5. 2 Sign Up Test Case .....	148
Table 5. 3 Forgot Password Test Case.....	149
Table 5. 4 Dashboard and Clinic Reporting Test Case.....	149
Table 5. 5 Manage Pet Owner Registration Test Case.....	150
Table 5. 6 Search Patients(pet owner and pet) Details Test Case .....	151
Table 5. 7 List of Pet Owner's Pet Test Case.....	151
Table 5. 8 Pet's Medical History Records Test Case .....	152
Table 5. 9 Pet Vaccination and Deworming Record Test Case .....	152
Table 5. 10 Pet Registration Test Case .....	154
Table 5. 11 Manage All Pet Registration Test Case.....	154
Table 5. 12 Manage All Pet Waiting List Test Case.....	155
Table 5. 13 Choose Appointment Type Test Case.....	156
Table 5. 14 Calendar Appointment Test Case.....	156
Table 5. 15 Staff Manage Appointment Test Case .....	157
Table 5. 16 Assign Follow Up for Vaccination and Deworming Test Case .....	158
Table 5. 17 Manage Veterinary Staff Test Case .....	158
Table 5. 18 Manage Pet Services Test Case .....	159
Table 5. 19 Veterinarian Appointment Calendar Test Case.....	160
Table 5. 20 Veterinarian Appointment's List Test Case .....	160
Table 5. 21 Manage Ask Vet Test Case.....	161
Table 5. 22 Manage User Profile Test Case.....	161
Table 5. 23 Change password Test Case .....	162
Table 5. 24 Update Pet's Profile Test Case .....	162
Table 5. 25 Pet Owner Receive Notification for Next Vaccination and Deworming Test Case .....	162
Table 5. 26 Pet Owner Request Appointment Deworming Test Case .....	163

<i>Table 5. 27 Pet Owner Manage Appointment Test Case</i>	164
<i>Table 5. 28 Pet Owner Receive Notification for Appointment Status Test Case</i>	164
<i>Table 5. 29 Login for Pet Vaccination E-card Apps Test Case</i>	165
<i>Table 5. 30 Sign Up Test Case</i>	165
<i>Table 5. 31 Pet Vaccination E-card HomePage Test Case</i>	166
<i>Table 5. 32 Receive Notification Message Function Test Case</i>	166
<i>Table 5. 33 Pet List in Card View Test Case</i>	167
<i>Table 5. 34 Pet Details Test Case</i>	167
<i>Table 5. 35 List View of Vaccination and Deworming Test Case</i>	168
<i>Table 5. 36 Details of Pet Vaccination and Deworming Records Test Case</i>	168
<i>Table 5. 37 Create PDF for Vaccination and Deworming Records Test Case</i>	169
<i>Table 5. 38 Print Vaccination and deworming Records in PDF Using Wi-Fi Printer Test Case</i>	169
<i>Table 5. 39 Compatibility Testing Result for The Veterinary Clinic Management System</i>	171
<i>Table 6. 1 Outline of Objectives and Achievements</i>	172



## **CHAPTER 1 : INTRODUCTION**

### **1.1 Introduction**

Veterinary clinics offered various kind of services to pets such as treatments, vaccination and deworming, de-sexing, surgery cases, grooming, hostel services and boarding. People who have their pets will visit the clinic either to get the subsequent treatments or to make an appointment for their pets. So, pet owner have to fill in the registration form first in order to register before get a consultation with veterinarian. With the amount of pets that visits to the clinic, an interactive and effective approach should be applied to build the Veterinary Clinic Management System. This could help to manage the management of the clinic since this system will response in real-time and easy to be managed.

This system helps clinic to keep records of pet registration, treatment histories, setting up appointments and list down prescription to pets. This system helps to reduce problems when using manual system such as pet registration using form, pet's and appointment records using calendar book and diagnosis pets' record using form . Besides, this system also convenient as it can help the clinic to handle and manage their activity while at the same time allows staffs to generate report for the pet owner and pet who comes, for clinic references purposes. By using this kind of system, all the information of pets will be stored into database in a systematic and efficient. As all the records are kept in database, this can reduce the problem of lost data.

Besides, for vaccination and deworming services, the pet owner will be given a “vaccination clinic card” which hold their pets' personal details and medical or treatment records. The appointment dates will also be recorded manually in the card(written down), as well as the record of prescriptions given.

The “vaccination clinic card” is important to both pet owner and veterinarian or staff for their references. Usually, only pet owner will keep the vaccination clinic card and they must bring it every time they visit the clinics for vaccination appointment. Therefore, it is important for the pet owner to keep it in a safe place to prevent it from missing or misplaced and it is best for them to ensure that it is in the best condition for the clinics’ staff(veterinarian and staffs) to read and refer to.

As an alternative to this “vaccination clinic card” which is done manually and kept physically, a digital vaccination clinic card that would allow the pet owner to keep their own pet’s medical record will be developed.

## **1.2 Problem Statement**

Generally, pet owner who visit the veterinary clinic have to fill in the registration form in order to register. For pet owners who already be a membership, staff need to find their name using alphabets manually. There is also redundant pet owner’s data if the pet owners are not sure whether they have come to the clinic before. This is because the current registration is manual. Besides, most of the staff in the veterinary clinic still using paper works in their workflows such as keep pet records using book, write pet diagnosis record using form, manage an appointment using calendar books and so on. So when a pet owners come to the clinic, staff maybe need use a few minutes to find the pets’ records paper which is requires time. Moreover, there is a possibility of the appointment’s booking will clash at the same time due to staff mistakes. Because of this manual operations are done by staff in veterinary clinic, it may slow down the procedure in many ways hence the manual process is cumbersome, tedious and slow.

In addition, the staffs also facing a problem to acknowledge the data of pet owner and pet who comes to clinic due to there's no effective way to generate a clinic report.

Usually, veterinary clinics provide a 'vaccination clinic card' to the pet owner once they have registered for vaccination and deworming appointment for their pets. The card must be brought over to the clinic for every appointment. This 'vaccination clinic card' contains their pet's medical history such as when was the last time they did the vaccination and deworming for their pets. Problem occurs when the pet owner lost or misplaced the cards and they must returns to home to take it or they must register for the second time if the vaccination card is completely gone. These procedures are time-consuming and more workloads need to be done by both pet owner and front-desk staff.

### **1.3 Aim and Project Objectives**

The objectives in developing this project are:

- To analyse and design a veterinary clinic management system that replace paper-based manual system for user who work manually on writing and keeping records in hardcopies or physical files.
- To develop a web-based system that generate a report for veterinary clinic.
- To replace physical or hardcopy vaccination clinic card with and "electronic vaccination clinic card" by viewing the pets' information via mobile application during consultation or appointment session.

## 1.4 Brief Methodology

The methodology that been used to carry out this project is Systems Development Life Cycle (SDLC). There are seven phases involved in Systems Development Life Cycle (SDLC) such as planning phase, analysis and requirements phase, design phase, development phase, testing phase, implementation phase and maintenance phase that shown in Figure 1.1.

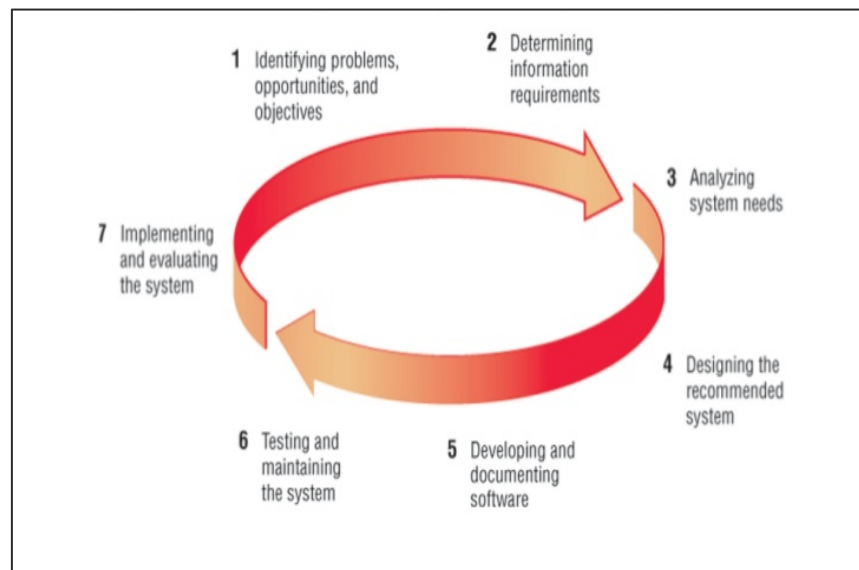


Figure 1. 1 SDLC phases (Kendall & Kendall, 2005)

### 1. Planning Phase

Firstly, in planning phase is to find out the scope of the problem and determine solutions. As mentioned earlier, the main problem is the workflow of the manual operation that been used by staffs in veterinary clinic is cumbersome, tedious and slow. Besides, staffs also facing a problem to acknowledge the data of pet owner and pet who comes to clinic due to there's no effective way to generate a clinic report. Lastly, physical vaccination clinic card is easy to lose or misplaced. If the pet owners forgot to bring the card, they must return home to take it or they must register for the second time if the vaccination card is completely gone.

## **2. Analysis and Requirement Phase**

In this phase, an analysis needs to be done. The requirements need to be collect through interview, questionnaires, and/or observation on site involved. To analyse system's needs, diagrams like use cases and sequence diagrams will be designed after user requirements have been obtained. From that, it will be more efficient to conduct the proposed project.

## **3. Design Phase**

Thirdly, based on the analysis that had been done during the analysis phase, the proposed system needs to be designed and sketch so that it can be achieve all the system requirements and needs of the users.

## **4. Development Phase**

Next, this is development phase where coding is involved. The main tool and programming language that be needed to develop this proposed project are Adobe Dreamweaver, Android Studio, HTML, PHP, CSS, Java and XML. In order for the coding to be complete, the user and the system requirements will be developed into a working system which will be tested in fifth phase which is testing phase.

## **5. Testing Phase**

During the testing phase, a number of users will be chosen to test on the management system. The process may be repeated to find any errors or bugs in the system. Test cases are used during testing activities. In addition, front-desk staff, pet owner and veterinarian from veterinary clinic are involved to test the usability of the system. This is to determine whether all the requirements have been achieved.

## **6. Implementation Phase**

The sixth phase is implementation in which the system will be deployed to a working environment after the system has been well tested.

## **7. Maintenance Phase**

Lastly, the system need to be fixed and updated from time to time to ensure it runs smoothly and working fine. Any new features or additional requirements will be done here per user's request. Therefore, documentation about the feedback will be prepared to maintain the system best functionality.

## **1.5 Scope of Project**

Based on observation, the system is being proposed to study the requirement from multiple veterinary clinics in order to obtain requirement as to create a veterinary clinic management systems and replace manual processes that involved in the veterinary clinics. This includes registration process, treatment histories, setting up appointments and to list down prescriptions to pets.

The veterinary clinic management system is developed to be used by the user which is veterinarian, front-desk staffs and pet owner. The veterinarian will update the pets' medical history each time the pet owner visit them. The front-desk staffs' main role is to register the pet owner and pets for the consultation sessions. Also, they can manage the appointment that made by pet's owner and generate a clinic report for pet owner and pet who comes to the clinic by using this proposed system. As for the pet owner, they can access their pets' medical record, request an online appointment and receive a notification of the appointment. Besides, they can view the pet's information via mobile application for vaccination and deworming appointment

and also would not be allowed to update their medical information. They can only update their personal details such as their phone numbers or emails in the system. From overall, this veterinary clinic management system requires web-based and mobile apps development to achieve the project objectives.

### **1.6 Significance of Project**

Veterinary clinic management system will significantly to bring more convenient and meet the users' requirement which is it would solve the real-world problems mentioned earlier; especially overcrowded clinics- specifically general veterinary clinic that occur almost every day. In addition, pet owner and pet details will available anywhere and anytime that can be access by the user. Other than that, the significance of the proposed management system will also be able to perform registration process faster and smoother than the manual process. Last but not least, the project is valuable as veterinary clinic vaccination card replacement will be easier as manual process replaced by digital system.

### **1.7 Project Schedule**

This project schedule uses Gantt chart to manage time control to ensure that the proposed project's development can be completed in a timely manner. The proposed of project initially started from 9<sup>th</sup> September 2019 until the 11<sup>th</sup> of January 2020. The Gantt Chart for this proposed project is as shown in Figure below:

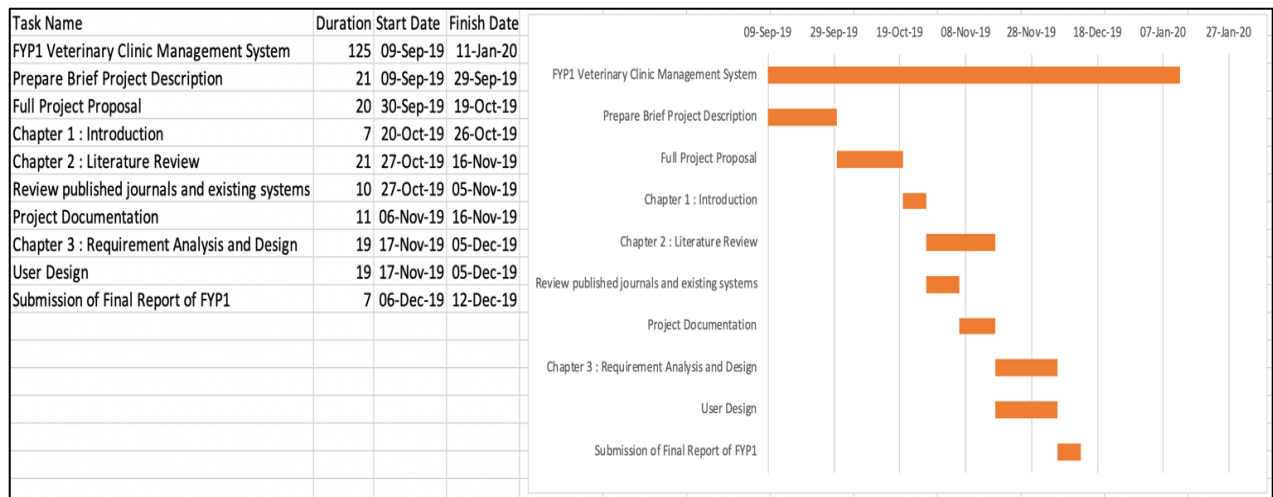


Figure 1. 2 Project Schedule for FYP 1

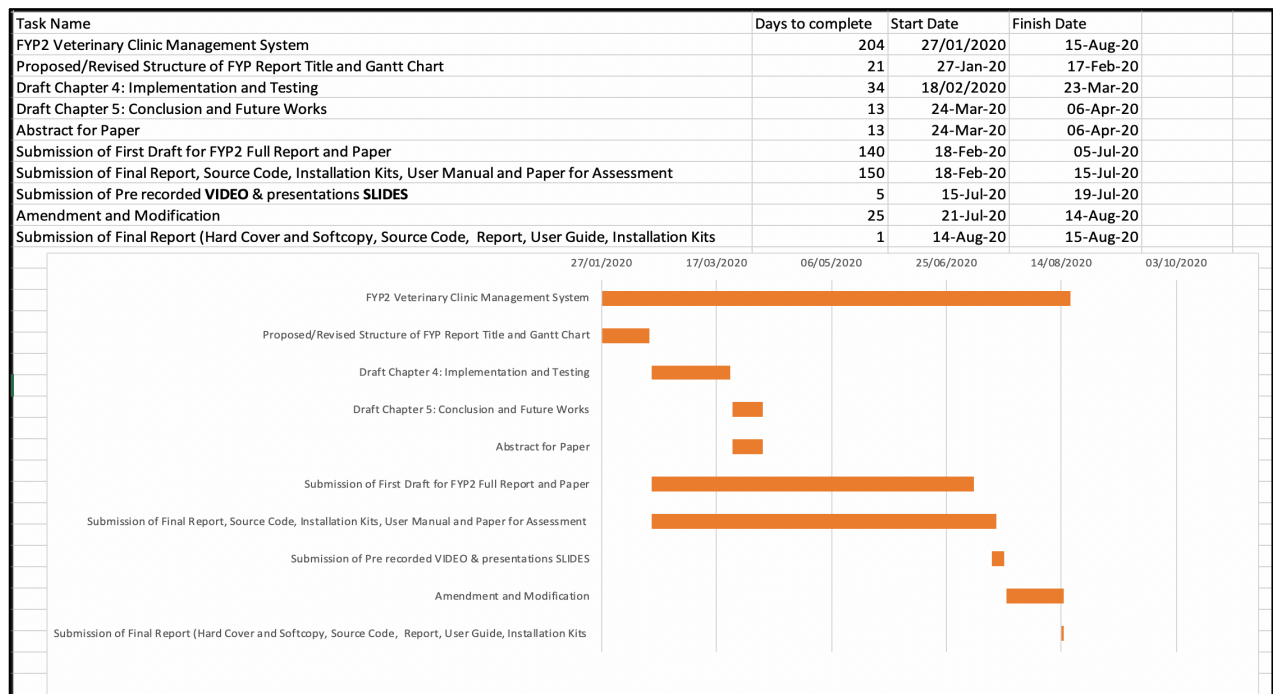


Figure 1. 3 Project Schedule for FYP 2

## 1.8 Expected Outcome

Upon the project's completion, all the objectives stated earlier should be achieved alongside a complete and working system which contains the pets' information inside its database. Veterinary clinic management system able to develop a system that support the workflow of the clinic starting from registration until the medication prescription process. For instance, by